



April 10, 2015

Town of Florence  
c/o Mr. Ken Hodson, Esquire  
Dickinson Wright, PLLC  
1850 N. Central Avenue, Suite 1400  
Phoenix, Arizona 85004

**SUBJECT: SUMMARY OF PREVIOUS WORK COMPLETED FOR THE TOWN OF FLORENCE HIGHLIGHTING THE IMPORTANCE OF AREA GROUNDWATER RESOURCES IN REGARDS TO THE USEPA DRAFT UIC PERMIT FOR FLORENCE COPPER**

Dear Mr. Hodson:

Southwest Ground-water Consultants, Inc. (SGC) is pleased to provide this summary letter report of previous work completed for the Town of Florence by SGC. This work highlights the importance of protecting groundwater resources in the Town of Florence Planning Area, especially in the area of the proposed Florence Copper, Incorporated (FCI) Pilot Test Facility (PTF). The location of the FCI PTF and its location within the Town of Florence Planning Area are shown in Figure 1, included in Attachment 1.

The Town's Designation of Assured Water Supply (DAWS) was approved by the Arizona Department of Water Resources (ADWR) in 1999. Due to anticipated future development in the area, in 2011, SGC prepared a Modification to the DAWS for the Town. The Modification was presented to ADWR to request an increase in the approved water supply to a total annual demand of 33,310 ac-ft/yr projected for the year 2025. The projected future water demand was based on a Water Master Plan, which was prepared for the Town by Fluid Solutions.

The primary water supply available to the Town of Florence consists of groundwater from the Lower Basin Fill Unit (LBFU) of the regional alluvial aquifer. The LBFU is generally found in the area at depths greater than 400 feet below land surface (bls). Other units within the regional alluvial aquifer include the Upper Basin Fill Unit (UBFU) and the Middle Fine-Grained Unit (MFGU). The UBFU is mostly saturated and is a source of drinking water, but is typically not targeted due to higher nitrate concentrations resulting from agricultural activities. The MFGU, which is also saturated, separates the UBFU and the LBFU. The MFGU is locally discontinuous and is not a targeted source of drinking

water. Water to meet projected demand for the Town of Florence will be provided by existing and *future* wells producing water primarily from the LBFU.

As part of the application submitted to ADWR, SGC prepared a hydrologic study demonstrating the physical availability of ground water to Florence for 100 years using historic and existing hydrologic data in conjunction with current ground-water models developed for the region. SGC conducted an impact analysis simulating pumping an estimated 33,310 ac-ft/yr for Florence using four existing wells and twenty-nine proposed wells spread throughout the Florence Planning Area. Florence is the owner of the existing wells and will install additional wells in the future as needed. A location map showing the Florence Planning Area and the simulated wells is presented on Figure 2, (Attachment 1). A summary of the wells used in the simulation is presented below.

ADWR Registration Number	Florence Well Name	Cadastral Location	Casing Depth (ft bls)	Water Level (ft bls)	Saturated Thickness (ft)	Pump Capacity (gpm)
55-610433	#1	D(4-9)25 BDC	350	179	171	1,400
55-215446	#3B	D(4-9)36 CAC	736	194	541	1,600
55-619533	#4	D(4-9)36 CAC	375	194*	181*	850
55-619534	#5	D(5-9)2 ADA	562	194*	368*	1,300
South Proposed Well	N/A	D(5-9)1 CCB	1083*	225*	858**	1,600*
Proposed Well #1	N/A	D(5-9)3 CBB	852*	190*	662**	1,600*
Proposed Well #2	N/A	D(5-9)3 BAB	830*	190*	640**	1,600*
Proposed Well #3	N/A	D(5-9)6 DAB	832*	130*	702**	1,600*
Proposed Well #4	N/A	D(5-9)5 ACA	838*	149*	689**	1,600*
Proposed Well #5	N/A	D(5-10)6 DBB	1000*	139*	948**	1,600*
Proposed Well #6	N/A	D(4-10)31 DAD	1000*	230*	848**	1,600*
Proposed Well #7	N/A	D(5-9)10 DBB	905*	116*	789**	1,600*
Proposed Well #8	N/A	D(5-9)12 CAA	1000*	152*	905**	1,600*
Proposed Well #9	N/A	D(5-10)8 DBB	1000*	222*	872**	1,600*
Proposed Well #10	N/A	D(5-9)16 ACC	968*	115*	853**	1,600*
Proposed Well #11	N/A	D(5-9)14 ACC	1000*	165*	908**	1,600*
Proposed Well #12	N/A	D(5-10)18 ACC	1000*	215*	907**	1,600*
Proposed Well #13	N/A	D(5-10)12 ACC	1000*	304*	761**	1,600*
Proposed Well #14	N/A	D(4-9)32 BAB	1000*	165*	1035**	1,600*
Proposed Well #15	N/A	D(5-9)22 BDD	1000*	159*	991**	1,600*
Proposed Well #16	N/A	D(5-9)24 CAB	1000*	201*	951**	1,600*
Proposed Well #17	N/A	D(5-10)20 ACC	1000*	280*	860**	1,600*
Proposed Well #18	N/A	D(5-9)30 DBB	1000*	108*	1545**	1,600*
Proposed Well #19	N/A	D(5-9)28 BDD	1000*	154*	1272**	1,600*
Proposed Well #20	N/A	D(5-9)26 BDD	1000*	194*	1099**	1,600*



ADWR Registration Number	Florence Well Name	Cadastral Location	Casing Depth (ft bls)	Water Level (ft bls)	Saturated Thickness (ft)	Pump Capacity (gpm)
Proposed Well #21	N/A	D(5-10)30 DBB	1000*	262*	920**	1,600*
Proposed Well #22	N/A	D(5-10)28 BDD	1000*	355*	773**	1,600*
Proposed Well #23	N/A	D(5-9)36 BDD	1000*	241*	1056**	1,600*
Proposed Well #24	N/A	D(5-10)32 BDD	1000*	319*	861**	1,600*
Proposed Well #25	N/A	D(4-9)32 ACA	1000*	165*	835**	1,600*
Proposed Well #26	N/A	D(4-10)3 CDB	1000*	173*	882**	1,600*

\* Estimated value

\*\* Aquifer saturated thickness based on total model layer thicknesses less the estimated water level. Well completion in this area not anticipated to include the full aquifer depth in most cases.

As noted in the table above, all of the *proposed* wells are planned to be cased to a depth of 1,000 feet bls, and would thereby produce water from the LBFU. In the pumping simulation, wells were placed accordingly to meet future projected demands. The locations were selected based on expected aquifer conditions such as depth to bedrock and to accommodate spacing issues with existing wells. It is expected that the actual future well locations may vary depending on conditions encountered at the time those wells would need to be installed.

The modeling conducted by SGC in support of the Town of Florence DAWS also indicated that simulated future pumping for some nearby Johnson Utilities wells could not be sustained long term due to the shallow aquifer depth at their present locations. In the 2011 Modification prepared by SGC for the Town, those wells were relocated in the simulations to portions of Johnson Utilities service area just west of the FCI property where the aquifer basin was deeper. Those locations within the Johnson Utilities Service Area were selected as the most optimal in regards to basin depth. As shown in Figure 2 (Attachment 1), at that time most of the relocated wells are directly downgradient of the FCI PTF. It is important to note that Figure 2 contains the exact data from the original Figure 12 from the DAWS Modification and has simply been enlarged for clarification purposes. The original Figure 12 from the DAWS Modification is included in Attachment 1.

As is demonstrated in this summary, future demand for water resources in the area of the proposed FCI PTF is high and the portion of the regional alluvial aquifer that is most critical and requires the most protection is the LBFU. The Town of Florence is concerned that, for reasons stated more fully in the Southwest Value Partners (SWVP) comments, EPA's approval of the FCI UIC permit may result in degraded aquifer conditions in the LBFU.



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If you have any questions or require additional information, please call.

Sincerely,  
**Southwest Ground-water Consultants, Inc.**



Kevin Hebert, P.G.  
Project Geologist

Attachment 1: Figures 1, 2, and 12

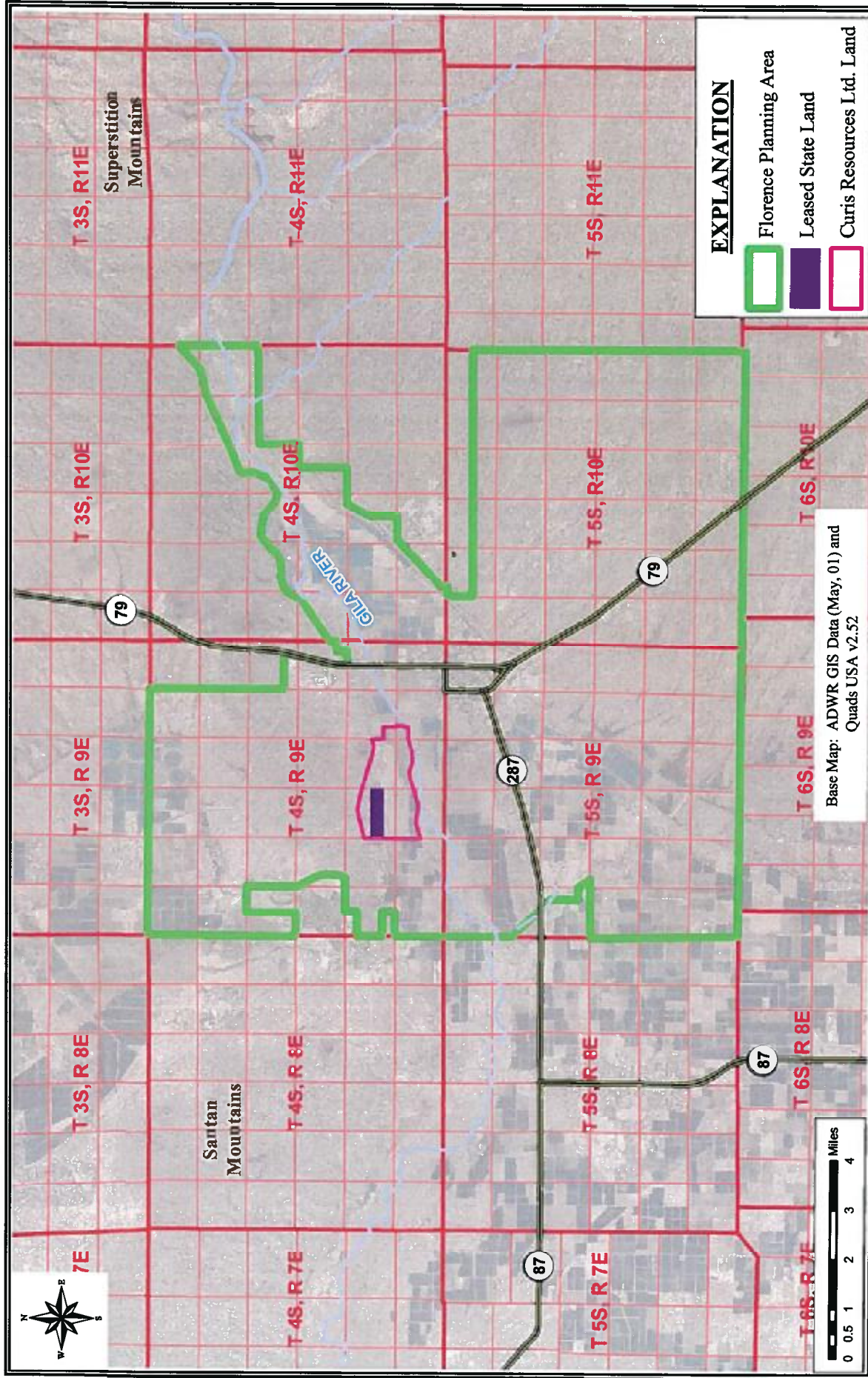


## **ATTACHMENT 1**

**Figures 1, 2, and 12**







**Southwest Ground-water Consultants, Inc.**

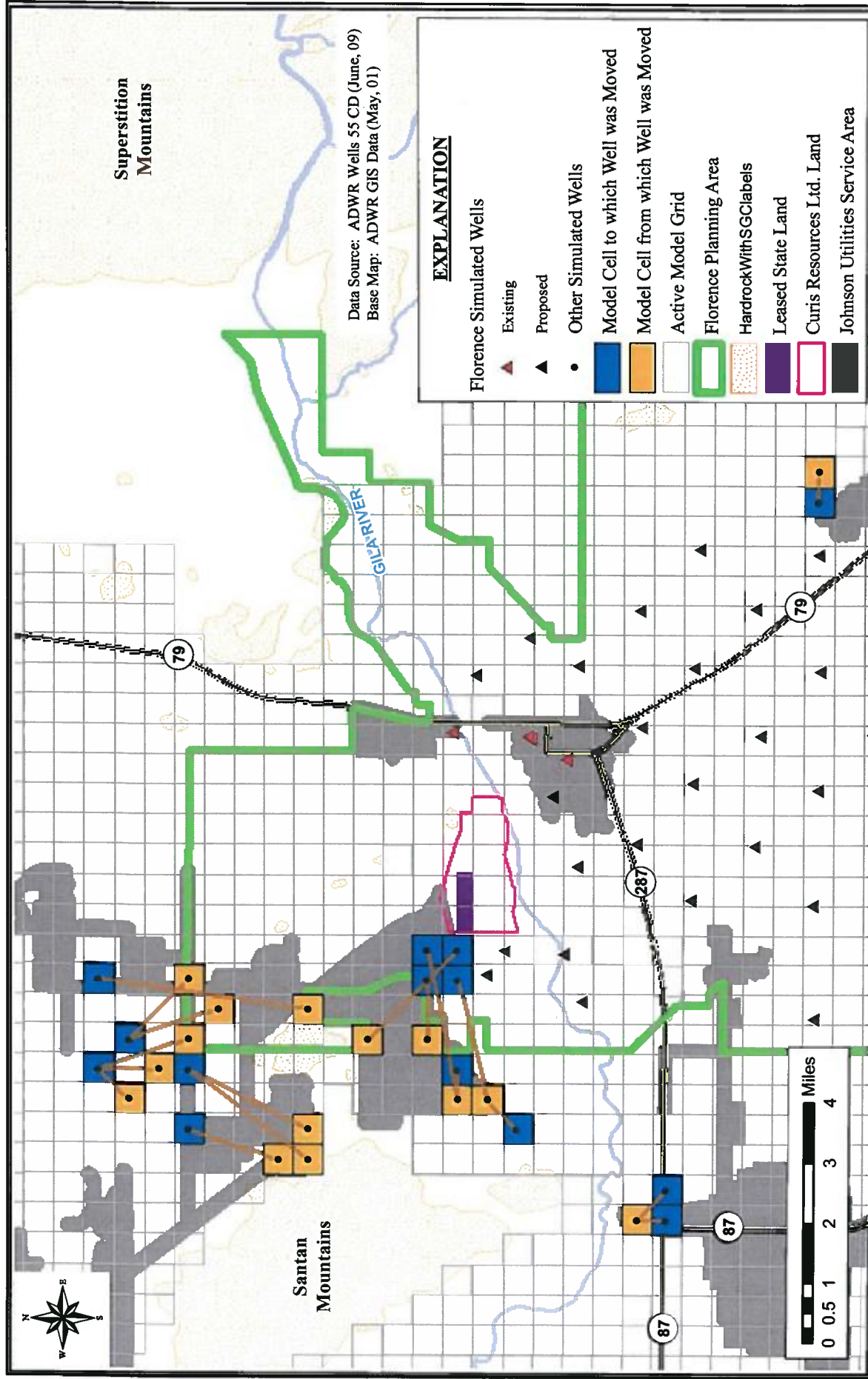
April 6, 2015 Project B.2177

## LOCATION MAP

Town of Florence, Pinal County, Arizona

**Figure**

**1**



**Figure**  
**2**

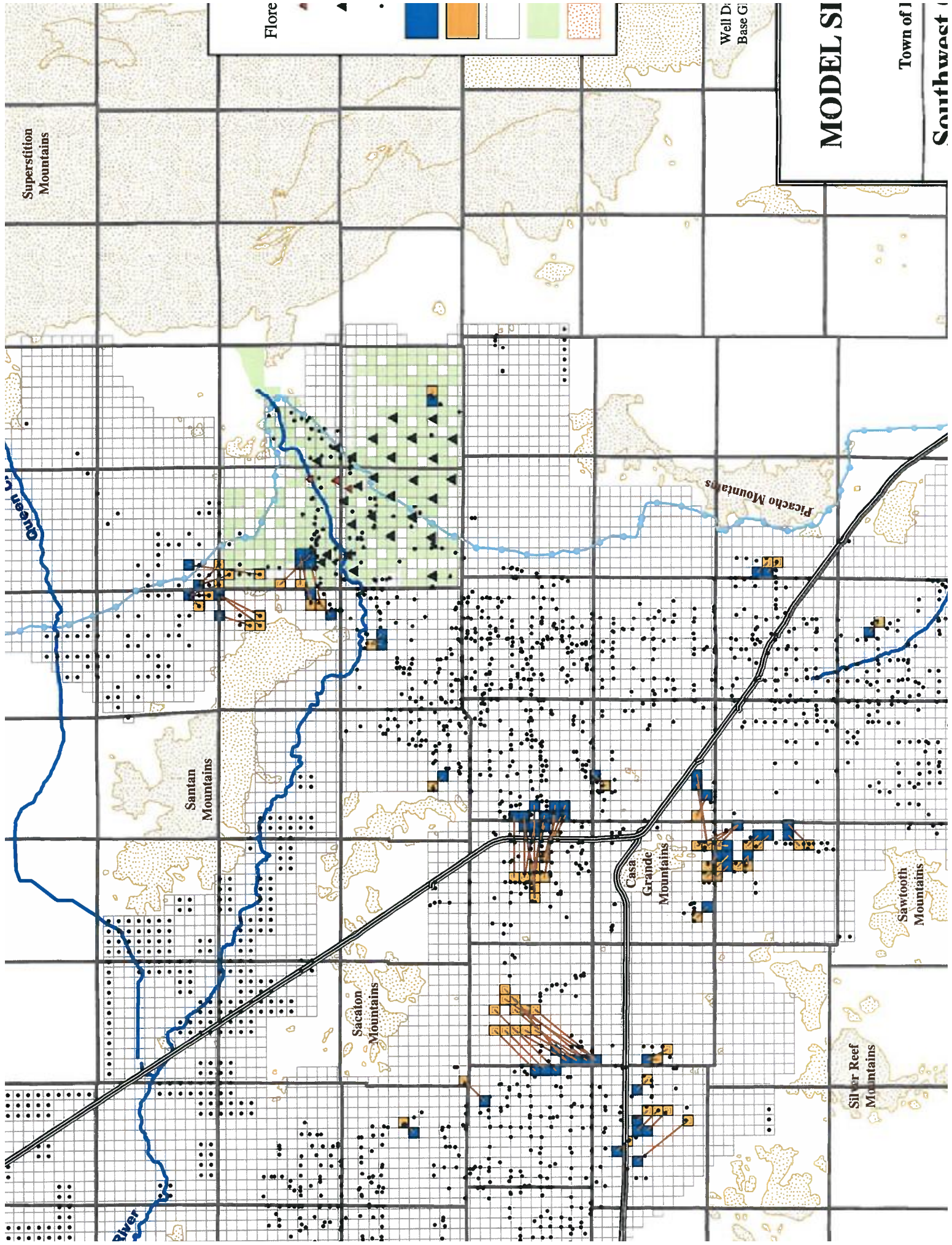
## WELL LOCATION MAP

Town of Florence, Pinal County, Arizona

**Southwest Ground-water  
Consultants, Inc.**

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